



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/529,391 | 06/06/2000 | JEFFREY S. HAGGARD | 0818.0014C | 7035 |

7590

07/08/2003

PATRICK J FINNAN
EPSTEIN EDELL & RETZER
1901 RESEARCH BOULEVARD
SUITE 400
ROCKVILLE, MD 20850

EXAMINER

YAO, SAMCHUAN CUA

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/529,391

Applicant(s)

HAGGARD ET AL.

Examiner

Sam Chuan C. Yao

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-6, 10-14, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Midkiff et al (US 5,707,735) in view of Mizoe et al (US 5,790,926), Kurata et al (US 3,928,958) and (Mathes et al (US 4,369,156).

With respect to claims 1-2, 6, 17, 20-21, Midkiff et al teaches forming a nonwoven fabric from fine denier fibers by forming (i.e. extruding) multi-components splittable fibers from at least two different and non-hydrophilic polymers; depositing the multi-components fibers onto a conveyor belt to form a spunbonded web; and subjecting the web to a hydro-entangling or needling operation to open or split the multi-components fibers in-line (col. 6 lines 15-42; figure 1). Midkiff et al does not disclose using polymer components having a relative difference in heat-shrinkage of at least about 10 percent, and heat-treating a web to open the splittable fibers. However, it would have been obvious in the art to heat-treat a web comprising conjugate fibers to open the splittable fibers, wherein the components in the conjugate fibers have differential thermal shrinkage, because: a) Midkiff et al is receptive to any effective methods of forming fibrillated fine fibers from splittable conjugate fibers (col. 6 lines 40-42);

and, b) Mizoe et al teaches heat-treating conjugate splittable fibers having components in the conjugate fibers with difference in rate of heat-shrinkage as an effective alternative to splitting conjugate fibers by either high-pressure water jetting or needling operation (col. 5 lines 16-59). Moreover, it would have been obvious in the art to use two incompatible polymers having a relative difference in heat-shrinkage of at least about 10 percent, because: a) one in the art reading the teachings of Mizoe et al as a whole would have readily recognized and appreciated that, the higher the difference in heat-shrinkage rate between components in conjugate fibers, the more readily the conjugate fibers split when they are subjected to a thermal treatment; b) it is well known in the art to form conjugate fibers where the difference in heat-shrinkage in components of the conjugate fibers can be as high as 40% as exemplified in the teachings of Kurata et al (col. 3 lines 26-33); and c) it is a common practice in the art to use form splittable conjugate fibers, where a difference in shrinkage in components of the conjugate fibers is at least 10% so that the conjugate fibers effectively split when they are subjected to a fibrillation treatment as exemplified in the teachings of Mathes et al (col. 2 lines 5-22; claim 1).

With respect to claims 4-5, since the recited heating means in these claims are conventional in the art; and since one in the art would have applied any known effective heating means to apply thermal energies to splittable conjugate fibers having components with differential thermal shrinkage in order to split the conjugate fibers, these claims would have been obvious in the art.

Art Unit: 1733

With respect to claims 10-11, see figures 2-5 of the Midkiff patent.

With respect to claims 12-14, one in the art would have determined a workable heating time in order to ensure an effective splitting of fibers is achieved. The heating time clearly depends on the degree in the relative difference in thermal shrinkage between a pair of incompatible polymers and the structure of the fibers.

With respect to claim 18, the limitation in this claim is notoriously well known in the art of attenuating fibers from a spinneret.

With respect to claim 19, see column 5 line 59 to column 6 line 14 of the Midkiff patent.

3. Claims 1-2, 4-6, 10-14, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizoe et al (US 5,790,926) in view of Midkiff et al (US 5,707,735), Kurata et al (US 3,928,958) and (Mathes et al (US 4,369,156).

With respect to claims 1-2, 4, 7-9, and 19-20, Mizoe et al (US 5,790,926) discloses conjugate spinning two different and incompatible thermoplastic resins to form conjugate splittable fibers, wherein heat-shrinkage of the thermoplastic resins is different relative to each other; heat-treating the conjugate splittable fibers to open or split conjugate fibers (col. 5 lines 16-59).

Mizoe et al does not expressly teach using two thermoplastic resins where a relative difference in heat shrinkage of the thermoplastic resins is at least 10%. In addition, it is unclear whether Mizoe et al envisions splitting conjugate fibers in a web in-line.

However, it would have been obvious in the art to use two thermoplastic resins where a relative difference in heat shrinkage of the thermoplastic resins is at least 10%, because because: a) one in the art reading the teachings of Mizoe et al as a whole would have readily recognized and appreciated that, the higher the difference in heat-shrinkage rate between components in conjugate fibers, the more readily the conjugate fibers split when they are subjected to a thermal treatment; b) it is well known in the art to form conjugate fibers where the difference in heat-shrinkage in components of the conjugate fibers can be as high as 40% as exemplified in the teachings of Kurata et al (col. 3 lines 26-33); and c) it is a common practice in the art to use form splittable conjugate fibers, where a difference in shrinkage in components of the conjugate fibers is at least 10% so that the conjugate fibers effectively split when they are subjected to a fibrillation treatment as exemplified in the teachings of Mathes et al (col. 2 lines 5-22; claim 1). Moreover, it would have been obvious in the art to split conjugate fibers in a web in-line, because: a) it is a common practice in the art to split conjugate fibers in a web in-line by subjecting the web to hydroentangling or needling operation as exemplified in the teachings of Midkiff et al (col. 6 lines 14-42); b) Mizoe et al teaches heat-treating conjugate splittable fibers having components in the conjugate fibers with difference in rate of heat-shrinkage as an effective alternative to splitting conjugate fibers by either high-pressure water jetting or needling operation (col. 5 lines 16-59).

With respect to claims 4-5, since the recited heating means in these claims are conventional in the art; and since one in the art would have applied any known effective heating means to apply thermal energies to splittable conjugate fibers having components with differential thermal shrinkage in order to split the conjugate fibers, these claims would have been obvious in the art.

With respect to claims 10-11 and 16-17, see figures 1-5 of the Midkiff patent.

With respect to claims 12-14, one in the art would have determined a workable heating time in order to ensure an effective splitting of fibers is achieved. The heating time clearly depends on the degree in the relative difference in thermal shrinkage between a pair of incompatible polymers and the structure of the fibers.

With respect to claim 18, the limitation in this claim is notoriously well known in the art of attenuating fibers from a spinneret.

With respect to claim 19, see column 5 line 59 to column 6 line 14 of the Midkiff patent.

4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references set forth in numbered paragraph 3 as applied to claim 1 above, and further in view of Pike et al (US 5,759,926).

Pike et al teaches forming a web from splittable ribbon-shaped multi-component fibers having interleaving components, and splitting the fibers in-line (col. 5 lines 16-50). It would have been obvious in the art making the splittable multi-components fibers taught by Mizoe et al to use the fiber-structure suggested by

Pike et al, because one in the art would have applied known splittable multi-component fibers configuration such as the one suggested by Pike et al. None, but only the expected result (i.e. effectively splitting multicomponent fibers by heat-treatment) would have achieved.

Allowable Subject Matter

5. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the references taken teaches using the particular components recited claim 15.

Response to Arguments

6. Applicant's arguments with respect to claim 1 has been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Chuan C. Yao whose telephone number is (703) 308-4788. The examiner can normally be reached on Monday-Friday with second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W Ball can be reached on (703) 308-2058. The fax phone numbers

Art Unit: 1733

for the organization where this application or proceeding is assigned are (703) 305-7115 for regular communications and (703) 305-7718 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.


Sam Chuan C. Yao
Primary Examiner
Art Unit 1733

scy
June 30, 2003